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ABSTRACT

Based on the unsubstantiated conclusion of many Hualapai analysts that the glottal stop is one of the phonemes of the language, this paper argues that the glottal stop is for the most part predictable. Data are presented to show the instability as well as the predictability of the glottal stop, and rules are presented, based on the Sound Pattern of English feature system, for the derivation of the glottal stop. Various grammatical functions that the glottal stop performs are presented, along with an explanation of how it is gradually losing this role in Hualapai syntax. Finally, evidence from other Yuman languages (e.g., Mohave, Cocopa, Paipai, Diegueno and others) is used to show that this gradual loss of the syntactic role of the glottal stop is not unique to Hualapai. The data used in this analysis are taken primarily from Wares (1968), Hinton and Langdon (1976), and Watahomigie et al. (1982). Contains 19 references. (LB)

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ON PREDICTING THE GLOTTAL STOP IN HUALAPAI[1]

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Abstract: Without providing substantial evidence, many Hualapai analysts have posited the glottal stop as one of the phonemes of the language. In this paper, I will argue that the glottal stop is for the most part predictable. Evidence from other Yuman languages also shows that this phenomenon is not unique to Hualapai.

1.0 INTRODUCTION

The behavior of the glottal stop in Hualapai is a very interesting one. Certain linguists (e.g., Winter (1957) Wares (1968) Watahomigie et al (1982)) have attributed a phonemic status to this sound, while some (e.g., Redden (1966)) believe that since the glottal stop is very unstable it should not be assigned a phonemic status. What is rather surprising is that those who regard the Hualapai glottal stop as a phoneme do not provide any convincing evidence in support of its phonemic status. Similarly, those who regard it as non-contrastive ignore the important grammatical role that it plays in Hualapai syntax.

In what follows, I will provide evidence to support the view that, in spite of the "considerable functional load" (Winter 1957:18) that the glottal stop has, it is best regarded as a synchronically non-significant sound in Hualapai. In the first section of this paper, I will present various data to show the instability and the predictability of the glottal stop. I will also write rules, based on the Sound Pattern of English (SPE) feature system (see Chomsky and Halle 1968), for the derivation of the glottal stop. The second section will present the various grammatical functions that the glottal stop performs and how it is gradually losing this role in Hualapai syntax. In the third section, providing

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evidence from other languages, e.g., Mohave, Cocopa, Paipai, Diegueño and others, I will show that this gradual loss of the syntactic role of the glottal stop is not unique to Hualapai.

The data employed in this analysis are primarily taken from Wares (1968), Hinton and Langdon (1976) and Watahomigie et al (1982).

2.0 REANALYSIS OF THE GLOTTAL STOP

2.1 Glottal Stop After a Short Stressed Vowel

The most common environment where the glottal stop occurs in Hualapai is after a short stressed vowel. It is, however, surprising that whenever it occurs in this environment, in most cases, it optionally alternates with vowel length. For example,

1.	misí?	~	misí:	'girl'
	nithí?	~	nithí:	'aunt (mother's older sister)'
	bahé?do	~	bahé:do	'jail'
	yú?	~	yú:	'eye/face'
	wá?k	~	wá:k	'to sit'
	jivsó?	~	jivsó:	'ribs'

There are two ways of accounting for the alternation in (1). First of all, one could assume that the glottal stop is the underlying segment which is optionally realized as [?] or [:] finally or before another consonant. The above assumption will give us the following derivations:

2.	/misí?/	-->	[misí?]	~	[misí:]	'girl'
	/yú?/	-->	[yú?]	~	[yú:]	'eye/face'
	/wá?k/	-->	[wá?k]	~	[wá:k]	'to sit'
	/jivsó?/	-->	[jivsó?]	~	[jivsó:]	'ribs'

On the other hand, one might assume that length is the underlying feature while the glottal stop is one of its optional phonetic realizations. In this case, our derivational history will be as in (3).

3.	/misi:/	-->	[misi?]	~	[misi:]	'girl'
	/yu:/	-->	[yu?]	~	[yu:]	'eye/face'
	/wa:k/	-->	[wa?k]	~	[wa:k]	'to sit'
	/jivso:/	-->	[jivso?]	~	[jivso:]	'ribs'

A cursory look at the status of vowel length in Hualapai may cause us to doubt the validity of the first assumption (i.e., deriving length from the glottal stop). For example, there is a clear distinction between short and long vowels as shown in (4) below.

4.				
	pik	'dead'	θi:k	'to drink'
	gúla	'rabbit'	gú:la	'rabbits'
	ðiyuch	'relative'	ðiyu:ch	'relatives'
	qák	'to lay'	qá:q	'crow'
	ðék	'to be many'	ké:k	'to carry'
	búvk	'to twine a basket'	bú:vk	'to enter'
	bílk	'to burn (one thing)'	bí:lk	'to burn (many things)'
	gávk	'to have a large crack'	gá:vk	'to bet money'

The data in (4) shows that vowel length is phonemic in Hualapai, because long vowels consistently contrast with short vowels.

Aside from the issue of contrast, sometimes, in Hualapai, plurals are formed by lengthening a stressed vowel of the singular noun. For example,

5.	Singular	Plural	Gloss
	búd	bú:dj	hat
	bakhéd	bakhé:dj	policeman
	yumbúl	yumbú:lj	forehead
	yiwíl	yiwí:lj	thigh

In (5), the stressed vowel is lengthened and a suffix -j is added after the final consonant to form plurals.

However, if the final consonant is [ʔ], it disappears in the plural form as shown in (6) below.

6.	Singular	Plural	Gloss
	héʔ	hé:j	dress
	húʔ	hú:j	head
	míʔ	mí:j	foot
	ʔpáʔ	ʔpá:j	bullet
	yuʔsunyáʔ	yuʔsunyá:j	eye lash

If the glottal stops behaves like other consonants in the language, one will expect the plural forms in (6) to be as follows:

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7. *hé?j
   *hú?j
   *mí?j
   *?pá?j
   *yu?sunyá?j

The fact that the plural forms in (6) are not realized as in (7) lends credence to the assumption that the glottal stop could not have been the underlying segment in the alternations presented in (1).

Notice that if the singular form originally has a long vowel, the long vowel is retained and only the suffix -j is added to form the plurals. For example,

8.	Singular	Plural	Gloss
	dani:do	dani:djo	pocket
	jivá:k	jivá:kj	bone
	má:d	má:dj	body
	sal-siyú:d	sal-siyú:dj	glove

In addition to using the suffix -j with length in plural formation, there are many instances when plurality is simply marked by lengthening the stressed vowel (also see Watahomigie et al 1982:195).

9.	Singular	Plural	Gloss
	gúla	gú:la	rabbit
	gwevóy	gwevó:y	tire
	hmány	hmá:ny	child
	ilwí	ilwí:	snake
	hnal	hna:l	gourd
	olo	olo:	horse

If one were to assume that length is derived from /?/, there will be no plausible way to account for the instability of [?] in (6) compared to other consonants in the same environment in (5). The stability of vowel length as opposed to that of the glottal stop makes it more plausible to assume that when length alternates with the glottal stop, length is the underlying feature which is optionally realized phonetically as length or the glottal stop.

2.2 The Glottal Stop Before a Stressed Vowel

Another common environment where the glottal stop occurs is before a stressed vowel that is not

preceded by another consonant. The occurrence in this position is also observed by Redden (1966), Winter (1957), and Wares (1968). Redden claims that, "Primary-stressed vowels, not preceded by a consonant, are preceded by a glottal stop" (1966:11). For example,

10. ʔil 'worm'
ʔáw 'grandchild''
ʔól 'louse'
ʔóp 'No'

Similar to the data in (10) are cases where the glottal stop consistently occurs between two vowels (i.e., V_1V_2) where V_1 is unstressed and V_2 is stressed. For example:

11. daʔóp 'negative marker'
gwathgaʔól 'orange'
saʔádjawo 'store'
heʔélk 'to have lice'
diʔink 'to halk''
gwegidaʔóla 'cook/chef'

The occurrence of [ʔ] in (10) and (11) is derivable by a rule that inserts the glottal stop before a stressed vowel, which is not preceded by another consonant. Such a rule can be formalized as shown in (12) below.

12. Glottal Stop Insertion Rule:

$$\emptyset \quad \text{--->} \quad [ʔ] \; / \; \left\{ \begin{matrix} V \\ \# \end{matrix} \right\} \text{--} \; \underset{[+\text{Stress}]}{V}$$

The rule in (12) states that a glottal stop is inserted before a stressed vowel that is preceded by another vowel or a morpheme boundary. If rule (12) adequately accounts for the occurrence of the glottal stop in (10) and (11), it does not seem plausible to assign a phonemic status to it in such environments.

Notice that an unstressed vowel can occur in a morpheme initial position without being preceded by any other consonant or a glottal stop. For example:

13. uciʔ 'coals'
iyúʔ 'owl'
unʸáʔ 'road'
iyóʔ 'willow'
atáʔ 'reed'

ahá? 'water'
imác 'dance'

The lack of a glottal stop before an unstressed initial vowel, such as in (13), shows that the existence of the glottal stop in (10) and (11) is conditioned by a following stressed vowel.

Notice, that the occurrence of a smooth vowel onset, as shown in (13), is quite unusual, nevertheless, other Hualapai scholars apart from Wares (1968) attested to such data in the language (see Redden 1966 and Watahomigie et al 1982).

2.3 Glottal Stop Alternating With Initial Unstressed Vowels

Apart from alternating with length, the glottal stop is also observed to alternate with an initial unstressed vowel. For example:♣

14.	alav	~	?lav	'prickly pear'
	ahmá?	~	?hmá?	'quail'
	amú?	~	?mú?	'mountain'
	uwé?	~	?wé?	'mouse'
	awá?	~	?wá?	'house'
	atá?	~	?tá?	'reed'
	amúl	~	?múl	'antelope'
	umhúl	~	?mhú:l	'ash'
	enyá	~	?nyá	'sun'

The alternations above can also be accounted for in two ways, similar to the alternations with length and the glottal stop. One way is to assume that the glottal stop is realized as [u], [a], or [e] in initial position. The immediate problem with this solution is how to predict when the glottal stop becomes [u] as opposed to [a] or [e]. Since this prediction will be difficult to make, one may consider the other option, which is to assume that any unstressed vowel optionally becomes a glottal stop in initial positions. This alternative solution can be accounted for by the following rule:

15. Unstressed Vowel Replacement Rule
(optional)

$$/\ V\ / \quad \text{--->} \quad [\ ?\ ] \quad / \quad \# \quad \text{---} \quad C$$
$$[-\text{Stress}]$$

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The rule in (15) shows that an unstressed vowel is optionally realized as a glottal stop in initial position when followed by a consonant. This solution which assumes that an unstressed vowel in Hualapai can become a glottal stop, is supported by a similar phenomenon in Cocopa. Hinton and Langdon (1976:126) observe that the initial vowel of Cocopa is "structurally equivalent to the glottal stop of other Yuman languages. It should be noted that an initial glottal stop is present phonetically which, however, is not contrastive in Cocopa".

On the basis of the predictability of the glottal stop in all of the environments discussed above, it does not seem plausible to assign phonemic status to it. Nevertheless, in the next section, I will consider what might have led previous analysts (e.g., Winter 1966, Wares 1968, Langdon 1973, and Watahomigie et al 1982) to posit the glottal stop as one of the phonemes of Hualapai in spite of their awareness of its instability.

2.4 Syntactic Role of the Glottal Stop in Hualapai

Almost every Hualapai syntactician observes the fact that the glottal stop marks the first person pronoun singular prefix. For example:

16. a. Nya - ch gweviyám ʔ - gowá:m - ʔ -wi
I -Subj car 1st Pers drive 1st Pers Aux
"I am driving a car"

b. Nya-ch haygunyuwá:-l ʔ- yá:m -ay ʔ- yu
I Subj town-into 1st Pers go Fut 1st Pers Aux
"I will go into town"

c. Nya -ch ʔ- smá: ʔ- yu
I Subj 1st Pers sleep 1st Pers Aux
"I am sleeping"

The function of the glottal stop as the first person prefix is not unique to Hualapai. This role is also performed by the glottal stop in most Yuman languages. For example, Hinton and Langdon (1976), in their analysis of object-subject pronominal prefixes in La Huerta and Mesa Grande Diegueño,

observe that both La Huerta and Mesa Grande Diegueño use the glottal stop to mark the first person prefix. Their comparative data also led them to assign this function to the glottal stop in Paipai, Yuma, Hualapai, and Havasupai.

Similarly, Mixco (1978) claims that the glottal stop is particularly apparent in the pronominal verbal prefixes which includes the glottal stop as the first person marker.

Apart from functioning as the first person prefix in almost all Yuman languages, Redden (1966:18) also observes that as a suffix, the glottal stop distinguishes questions from commands in second person form. In addition, Watahomigie et al (1982) show that the glottal stop sometimes replaces the subject marker in Hualapai. For example:

17. a. Nya - ch gweviyám ʔ- há:m -yu
I Subj car 1st Pers see Aux
'I saw the car'

b. Nya - ʔ gweviyám - ʔ - há:m -yu
I Subj car - 1st pers -see - Aux
'I saw the car'

In (17a), -ch, which is the subject marker, is replaced by [ʔ] without changing the meaning.

All the above syntactic functional load may account for why previous analysts posit the glottal stop as a phoneme. However, it has been observed that younger speakers delete the glottal stop when it functions as a first person prefix or as a subject marker (see Winter 1966 and Wares 1968). Similarly, Watahomigie et al (1982) gave the following examples to show how the glottal stop is deleted without affecting the interpretation of the sentence except for the formality.

18. a. Nya -ch ʔ- smá: ʔ- yu (Formal
I Subj 1st Pers sleep 1st Pers Aux Speech)
"I am sleeping"

b. Nya -ch ʔ- smá: yu (Everyday
Speech)

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c. Nya -ch smá: yu (Everyday Speech)

In (18b and c) the glottal stop functions as the first person prefix is deleted without affecting the meaning of the sentence.

Considering everyday speech and the speech of younger speakers, it is obvious that the glottal stop is losing its syntactic role synchronically. Therefore, there is not enough synchronic evidence, based on the syntactic role of the glottal stop, to assign a phonemic status to it. It should, however, be pointed out that since the glottal stop still alternates with some phonemes in the language, one may assume that the change in the phonemic status of the glottal stop is still an ongoing process.

3.0 Evidence From Other Yuman Languages

The controversy over the phonemic status of the glottal stop is not unique to Hualapai. Wares (1968:39), in his comparative study of Yuman languages, admitted that he posited the glottal stop as a phoneme in Paipai and Diegueño only "for purposes of comparisons". He further stated that further investigation may show that the glottal stop occurs non-phonemically in Paipai. Similarly, for Diegueño, he observed that, even though the presence of the glottal stop often marks juncture, "it does not seem obligatory" (Wares 1968:37).

About eight years later, Hinton and Langdon (1976) noted that initially, the glottal stop is very unstable and is frequently omitted in Diegueño, and it is non-distinctive in Cocopa. As far as they are concerned, there is "a phonological trend to delete glottal stop, based on synchronic evidence of such a process in <u>most</u> (emphasis mine) Yuman languages" (Hinton and Langdon 1976:123).

As regards Mohave, as far back as 1911, Kroeber observed that the glottal stop is phonetically conditioned in the language, and in rapid speech, "it is likely to be slurred out of existence" (Kroeber 1911:63).

All the above observations lend credence to the fact that the gradual loss of phonemic status by the

glottal stop is a common process in most Yuman languages, and therefore not unique to Hualapai.

4.0 CONCLUSION

I have shown that the glottal stop is predictable in almost all the environments where it occurs. I assume that it synchronically co-exists with its alternants because the change is an ongoing process which has not been completed.

This trend is also evidenced in the syntax of Hualapai and other Yuman languages (see Hinton and Langdon 1976 and Watahomigie and others 1982) where the glottal stop can be dropped without affecting the interpretation of the sentence.

Notice, however, that this gradual change in the phonemic and functional role of the glottal stop is most prominent in the speech of younger speakers. What one can infer from this is that the glottal stop which was phonemic diachronically is gradually losing its contrastive power synchronically in Hualapai and most Yuman languages.

NOTES

1. Hualapai is a Yuman language spoken around Peach Spring, Arizona. It is closely related to Havasupai, Paipai, and Yavapai which are regarded as a subgroup of the family (see Langdon 1975)

2. The data in this paper are written in Hualapai orthography unless otherwise specified. For example,

d = [ṭ]
~~d~~ = [t]
g = [k]
~~b~~ = [p]
ch = [c"]
j = [c]
ny = [ñ]

3. These examples are from Wares (1968).

4. See Watahomigie et al (1982) for similar alternation between the glottal stop and an initial unstressed vowel.

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